Notebook, N-92-02-22

This notebook was begun during February 1892. All entries are by Edison. The book contains notes and drawings relating to various electrical experiments. Included are entries regarding the conductivity of iron, magnetism, Foucault currents, telephone transmission, and the optical behavior of iron subjected to alternating current. There are also theoretical notes about the properties of aluminum, along with drawings, notes, and calculations pertaining to ore milling. Among the latter are several pages of cost analyses, probably based upon operations at the New Jersey and Pennsylvania Concentrating Works plant at Edison, N. J. in September 1892. The pages are unnumbered, and the book has been used in both directions. Several pages have been removed from the book. Approximately 110 pages have been used.

Experiments

Feby 22 1892

Make a cylinder 1 inch dia of 75% Iron reduced by Hydrogen + melted shellac - it is to be 6 inches long -

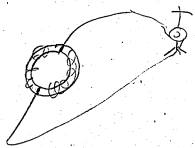
Also one with 100% iron wetted with minimum shellac in alcohol stirred + dried - then put into cylinder, heated + pressed slightly to obtain coherence -

About to test of continuous electrification takes place under high frequency currents. If continuous flow can be had -

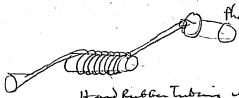
-000008

-000001

Curve of hysteresis to be run on
Red hot iron - kept hot by current
while iron wire in Vacuo -
also iron bar surrounded by coils
of iron wire - whole immersed in
blacksmith fire -

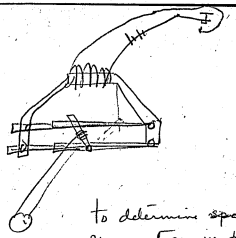


Ring split + 2 def metals like
gold + aluminium foil inserted
differential effect of heat of hydrogen
gas current - Run Curve

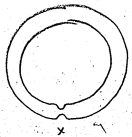


Hard Rubber Tubing wound around shell - High note - see of amplification in Rubber tube of note = wave length must be less than a single turn. or say the same -

Test it the Ultra Light that determines the flow of Electrification Current into Carbon wire in glow lamp -
to prove it shield it with a metal not Connected - shield with glass - then with gravity -

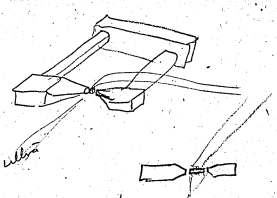


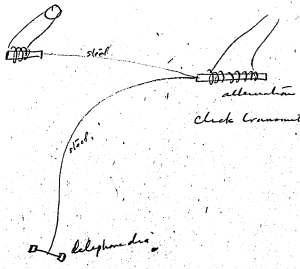
to determine ~~speed~~ of
Magnetism in different
magnetic bars like
Dipping Equipt with flow
heat along a bar

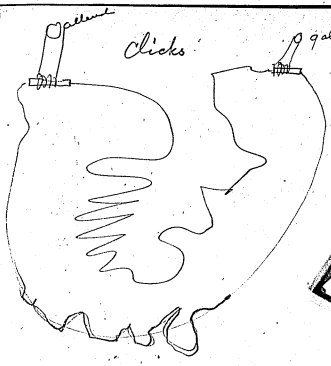


iron ring
Saturated How
would be strength
of lines at X if
would they be
permanent.

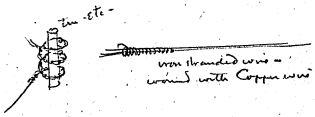
would they stay permanent on
Saturation.

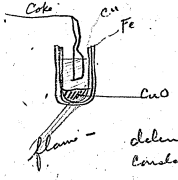

wires
wires (vibrates) to
get impulses


steel
alternator
(clock commutator)
steel
telephone



Rings of,
Tin - Lead - Zinc - Brass -
Copper - Antimony Bismuth.
Arsenic. Sulphide Iron
phosphide Iron - Aluminum
Magnesium -, Sodium in tubs.



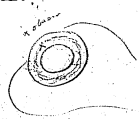


Trij phos acid.
& fusible salts
which will let go
their H_2O at red
heat or above &
which don't contam
with CuO, unless
free H_2O -

delicacy R - Volts &
Consistency + efficiency

Try thin films of metal on glass see if they reverse lines in spectrum in same manner as vapor of a metal reverses its own lines

Make film into an closed ring & study the optical behavior under alternation of current.



Will there be free lines of very thin - will it stay permanently changed - will stress polarize light or alter amount of color reflected or transmitted -

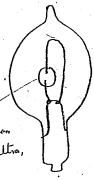
deposit Carbon & Iron Simultaneously see if permanent magnet results follows from mere mechanical motion -

with a cylinder of finely divided
iron mixed with Conducting Lampblack
not any different but reason of
presence of Carbon.

Will a cylinder of iron particles
Compressed together, each iron
particle which was previously
deposited with Copper in Vacuo
act peculiar as to retention of
magnetism by low resistance
Ckts of Copper —

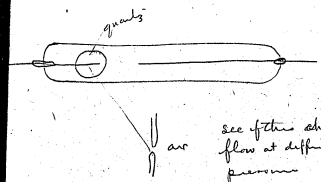
Is there such a thing as molecular
Permeability in contradistinction of
Mass permeability,

Is there an analogous Extension
in Copper wire to that of iron magnetized
by passage of Current,
say Leyden —

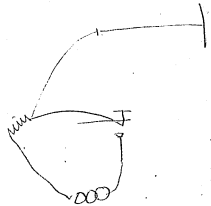


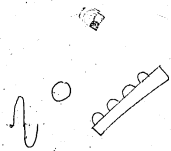
block flow to guard Sulfur,

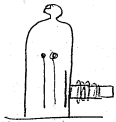
Will there be a Continuous flow -

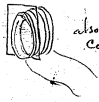


see if this changes flow at different pressure



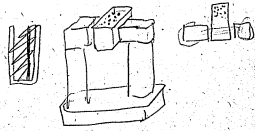




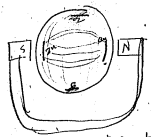


deposit the film of Iron Ni & Co
w. magnetic field.

Is Carbon (red or white hot)
Magnetic



pieces of zinc coated nearly all over with alkaline
varnish to Cork & floated in 20% SO4 H2 O5 of
the magnet if local action exists forms cuff
to be attracted by magnet.

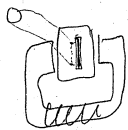


Will the magnet cause the current to be doubled?

If so perhaps a current can be got from local action on Zinc in HCl.

Why is it that aluminum unlike all other metals does not deposit metal on the sides of a opaque tube yet all the phenomenon takes place as with other metals – Can it be possible that pure aluminum ~~transparent~~ when deposited on the sides + cooled by flakes off or so aluminum decomposes into a gas or what?

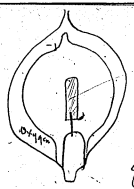
Zinc in cork in HCl –
Local action circuits
ought to cause
motion in Zinc
in the field –



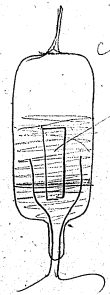
ought not current from
Local action in HCl
with the 2 plat wire
by magnet paralleling
the circuit.

See Knott Phil Mag 1890 246 –

~~Hysteresis~~ Cyclic curves profoundly
modified by passage current,
may not be due to transformer
effect or increment.



Vacuum - Crack between
Ox. globe + Vac
glow worm light



closed glow chamber

phos -
free O +H
given off Carbon
with phos gas
phos acid which
dissolves + then
glow continues
until all H_2O
decomp -

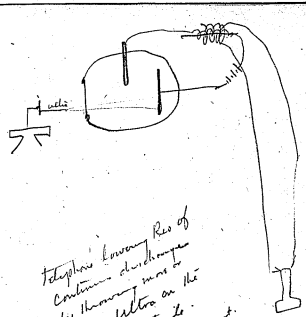
Would an intermittent or oscillatory spark be recorded by Luminous paint -

Joint this ∫ on glass in Leyden jar the electron Cathode cant work at 3 millionth of a sec

What relations are the Curves of loss of energy (watts) in a glow lamp to the Curve of Magnetic Saturation

at high cp. big energy added changes very little rise temp. strongly increased rapidly radiation

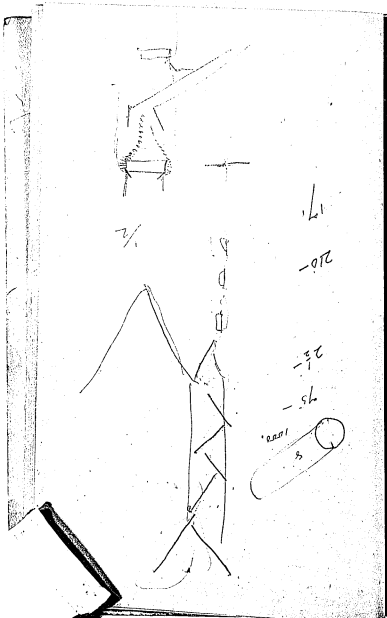
Would there be any glow in a giessler tube made of Quartz or Rock Salt

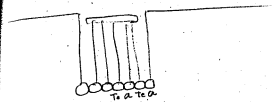


Telephone Lowering Res of
Continuous discharge
by Thermo-Ions on the
Rapht Electrode
use 1200 Volt Cond.

Expansion of Carbon Curve with Volts & Res Curve

How does the Curve of fall
of Resistance in glow lamp fil
with Rise of Voltage
agree with Saturation Curve
of magnet.
is the go up & Come down the
same Carbon is plastic like
glass at high temp



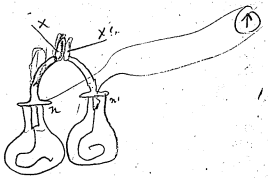


Increase Emf for Etheric.

Wooed glass or other things dressed by Electrifier or Magnetism permit Ether to pass like Rock salt,

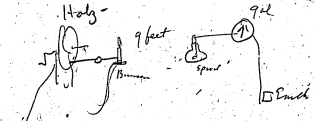
will it pass a film of gold or Rock salt.

Why is it that Aluminum when used as a filament melts 75% stays solid as a crust. it looks like 75% XYZ + 25% aluminum

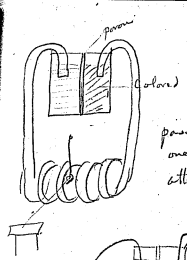


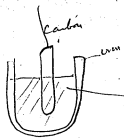
By burning different fluids in the two apparatus Currents should be established between n & n' or waves in the flame at different points X. X' –

Amphidromy 1887 Black is note



Continuous Current flow.


porous
(colored)
pass light through
one liquid is transparent
other (colored) —
Plat



or any other metal which will give a ~~[illegible]~~ Sulphide at red heat - (Reaction, CS- + Fe deposited - or the Cell of a metal + lined with a Conducting Sulphide which don't melt at Red - then use KS or NaS.

Reaction CS - K reduces S of Sulphide leaving to regenerate KS,

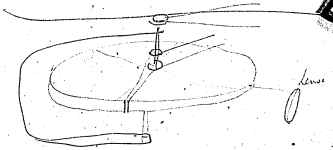
Will a thermo element act different in capacity or efficiency when heated in dif positions in a magnetic field —

In Experiment C + CuO Red hot, use KO as it dissolves CO —

Reaction is C . . K O . CuO .

CO – KO – Cu Do not use NaO,

dissolved



Whirling the thin band (transparent film) around rapidly with Sun focussed on it will give a current in same direction, whatever the direction of the rotation.

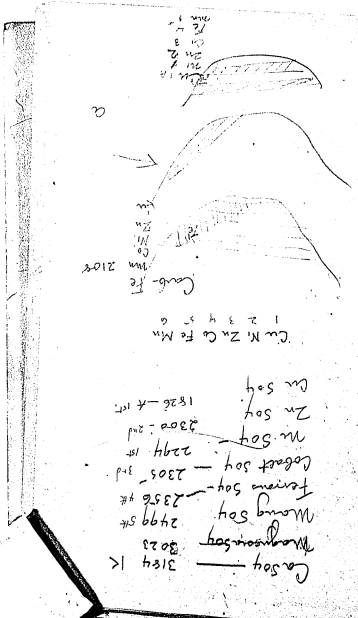
= Condensation will precede at the expense of heat.

must be transparent yet conducting
although wanted all be absorbed
between surfaces & opaque interior by
both underneath not heated same time.

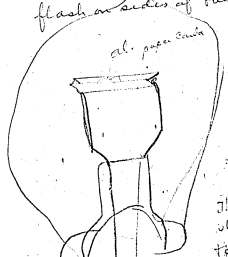
Jupiter Atomic Wt all is made + 2 or 3 specimen lines

Spectrum Anal - Watt. p 386 -

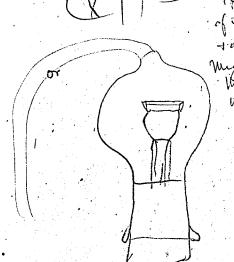
Remark Words - of all the metals
Aluminum is found to be the
richest in Ultra Violet invisible
rays - of extra extreme refrangibility
Now take in the fact that Ultra
Violet waves reduce the Resistance
at spark points & again that
in greater Tubes nothing is
apparently torn off & deposited
on the walls it would look as
if atoms of al periodic with Ultra
waves & hence no rise of temperature
Take pleasure to melt the surface
again when al melts as a loop
in Vac 75% dont melt & 25% runs
out - in Carbon furnace at which
in perfectly inert oxide furnace of brought
up slowly in Gilch preserves the form
only little melt runs out
immediately



Melt some aluminum in vacuo & let it flash on inside of tube



This will give sheet CP aluminum
+ permit determination of its R & R for Hect.
+ other properties -
Might allow letting pass through even in thick sheets -



Mercury Sol. 2400 Cu Sol. 1620
Cadmium. 2108 Gold Sol. 225
Ferric Sulfate 6164 Quinine Sol. 35
Ferrous — 2356.
Cobalt Sulf 2305
Mn SO4. 2294
Zn SO4. 2300
H + Cl. Acid. 220 K
Sulphur Dioxide 512 710 K
Na Cl - 972
Cu Cl. 1692
Cu SO4 - 3162
Cadmium - 2704
Bi Magnesium 1510 K
Sulfide 3023
Dimethylaniline 1234

The specific heat of Carbon increases as the temperature rises so Silicon - Boron - + Beryllium up to 500 - ~~[illegible]~~ and the increase of SH diminishes as the temp rises between any two intervals of 100 - Now the Electrical Res diminishes in same way, there has a close relation between Res & Specific as the two are proportional. The price Hzyl of all Metal Could be determined by the Curve of increase of Res by rise of Temperature -

We might so that ~~any Extraordinary~~ ~~of heat~~ Metals having greatest specific heat ought to be best Conductors by Equal Weights - See if this is so -

In very high Vac in glow
Lamp Sulphur ~~+ other~~ Vapor
Iodine could be driven in
by heating globe & then the filament
heated high current give a
true & pure Spectrum at Known
temperature -

21 ft 3"

8 ft wide

84	3"	45360
78	3	42120
72	3	38880
66	3	35640
60	3	32400
54	3	29160
48	3	25920
42	3	22680
		272160

4 43

54 × 3 = 162
486 ÷ 3 = 29.16

189 × 3 = 567
4252.5 ÷ 3 = 1260
3780 ÷ 3 = 2268

48 × 3 = 144
4320 ÷ 3 = 2592

66 × 3 = 198
594 ÷ 3 = 3168

8 tm

16 × 8 = 128

$\frac{1}{5}$

5

73 × 3 = 219
219 × 3 = 648
648 ÷ 60 = 38.8

24 × 8 = 192

10 : 10

50	5^{-5}
100	2.5
200	1.25
400	.62
800	.31

100 000 — 10 — 10

73 × 3 = 219
219 × 3 = 657
657 ÷ 60 = 10.95

60 / 1000 = 16
60
400
360

10 —

18,000 ft/lb

84 × 3 = 252
252 ÷ 3 = 75.6
75.6 ÷ 16 = 4.73

16 ft sec

$\frac{1}{5}$ sec —

1725 / 272000 = 157
1725
9920
8640
12800
12096
7536

7' dia x 7' stroke 75000 lbs 1 min

100000 min

480
48
3840
19200
2304

1396
60
48
83760
69120
14640
13824
816

175
3000 —
50 tons per hour —
150
2850
18
40
724
288

800

800

40 min

200

175

100 ton 1 foot in $\frac{1}{5}$ of sec

25
32 800

222400 lbs 1 ft in $\frac{1}{5}$
55
1112000 — in 1 sec
60
1112000 (2022
33000 | 66720000
66000000
2000000
7600000
6000000

16 lbs

15-

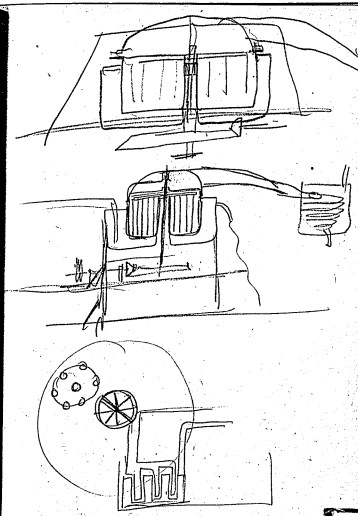
18 dia -

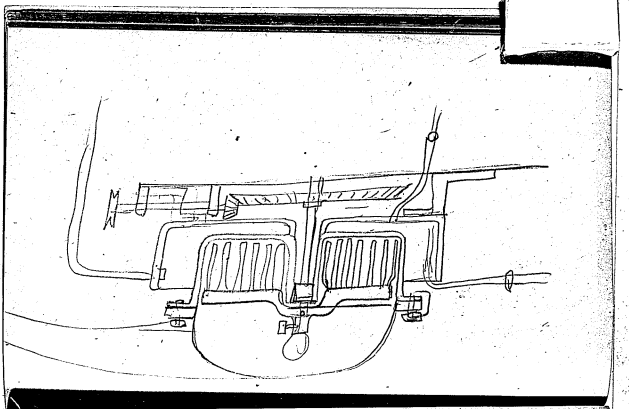
18
18
144
18
324
15
1620
324
4860 =
135
1728 | 21725
3456
12696
1296

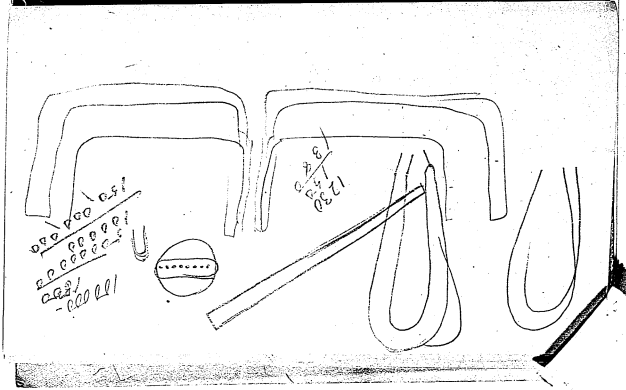
27

9
15-
9
135-

16
gmm
26000
120 | 26
40
760
16
160
960
50 gmm
144 | 600
4
576 -800
2







(17 yr/35

1200 lb 30,000 4 days

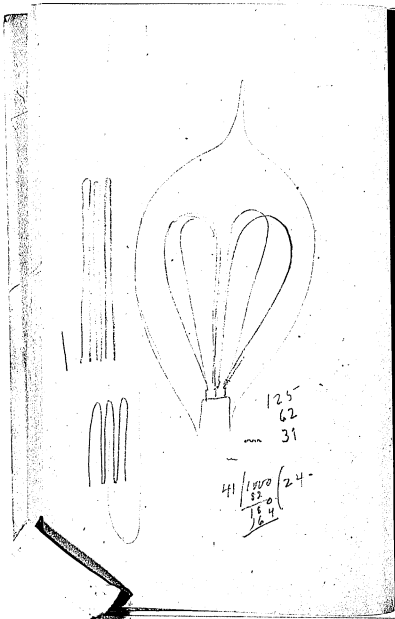
18000 = 300 —

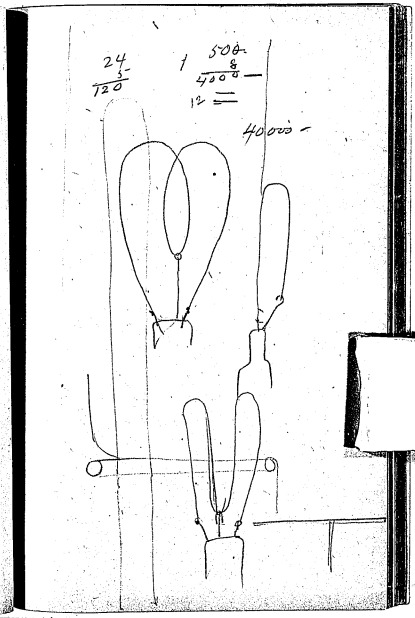
40 days

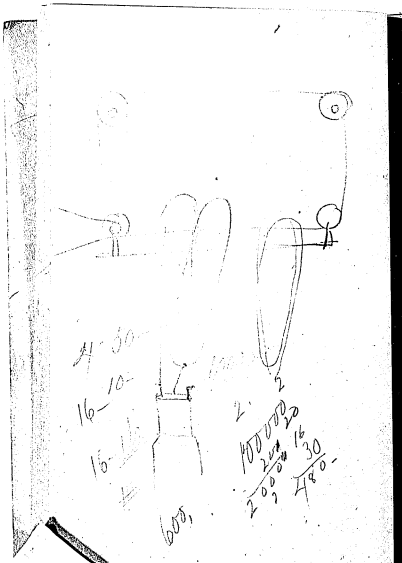
464 | 0.08
580 —
0.08

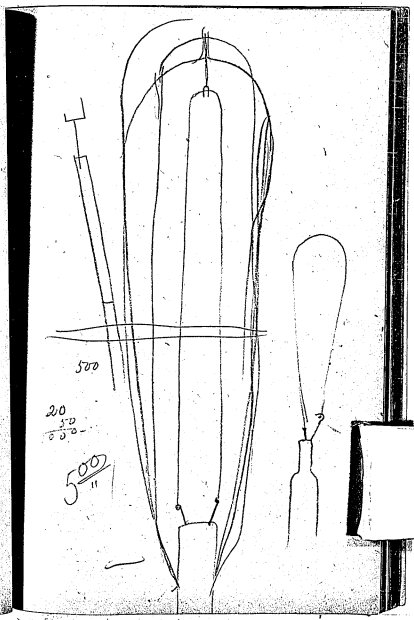
139200 | 130 000 000
0000000
2 785 000
0000000
2 785 000
2 4 4

344
2 0.6 4
344 60 —


125
62
31
41 | 1950 | 24
32
80
160
160


24
5
120
1 50
8
400
12
4000


14 50
16 10
15 15
600
2
100000 50
200 16
200 30
7 180


500
20
50
500
500

Σ – of Freddy's gold Crude – Inlefred

Σ – of House's Ingots.

~~[illegible]~~

Freddy's gold squeeze – private sales

Brown Freddy Cathy – way up Country.

Store Crude – Jim Cross House –

Store ingots – House –

~~Store squeeze, Infe ingots~~

Store file packed Cozy Minerals Lab – Long, free – safe deposit vaults

128
20
480) 2560 (5.3
2400
160

16
30
480

.500 lbs

64 –

480 480
60
28800

5 lb

280 – grms acc revalen –

2500
3
7500
750
750 0
7500

~~24 grms~~ 20 grms

223) 28800 – (128.
223 –
630
450
1800
1800

1728 | 20736 | 12.
1728
3456
3456
21
12
242
252

465
18
93
18
261
252
84
3
252

84
83
82
81
80
79
78
77
76
75
74
73
72

252
249
246
243
240
237
234
231
228
225
222
219
216
3042 inches
72
6084
21294
21904 | 126
1728
4656
4656
4656

144
144
576
576
144
20736

62
18
3
4344
2073

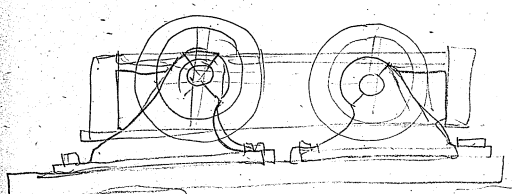
21
63

1.
1728
4656
636
636
7
3
1728

12 144

5580 lbs shaft each

Run 58000 lb each



other things
Runs 116,000
Shafts 11000
pulleys 60000
Bedplate 25000
212000

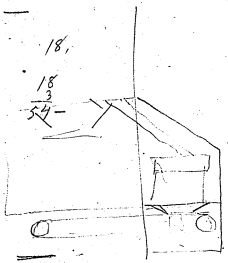
Flywheel 3500
Castings 4450
Delaware Bolts 2000
Foundation 1500

58.8

18.

58.

18
3
54



272

1600 tons

272 | 16000 | 58.8
1360
2400
2176
2240
2048

272
58
2176
1360
15776

32
84
16
2000
1728
6000
34
60
34
135
288.90
173
463
35
32
6
275
32
550
55
825
825
176
176

Coal 1000 —

285 —
190
408 —

15) 38000 (2533 yearly —

24 trips

15 pay trips

16

Cap 1st & 2nd officers
3 mates
4 Engineers
12 firemen
4 water tenders
2 stew...
10 others
...
Repairs etc
Provisions & Depots

3660

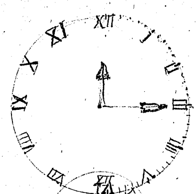
3000 lbs

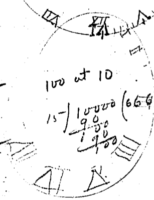
175
35
175

2750
240

20160

1000
2533
3533
666
4199 —

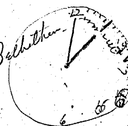




330 —
35 —
4

175 —

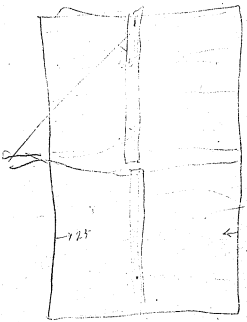
100 —
175 —
20
295 —
62
357 —

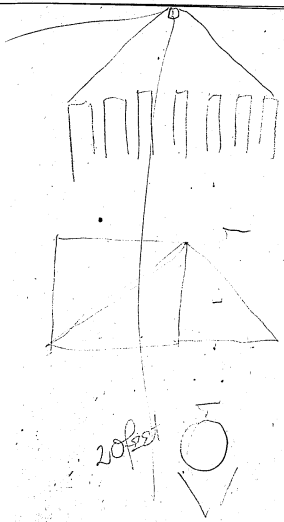


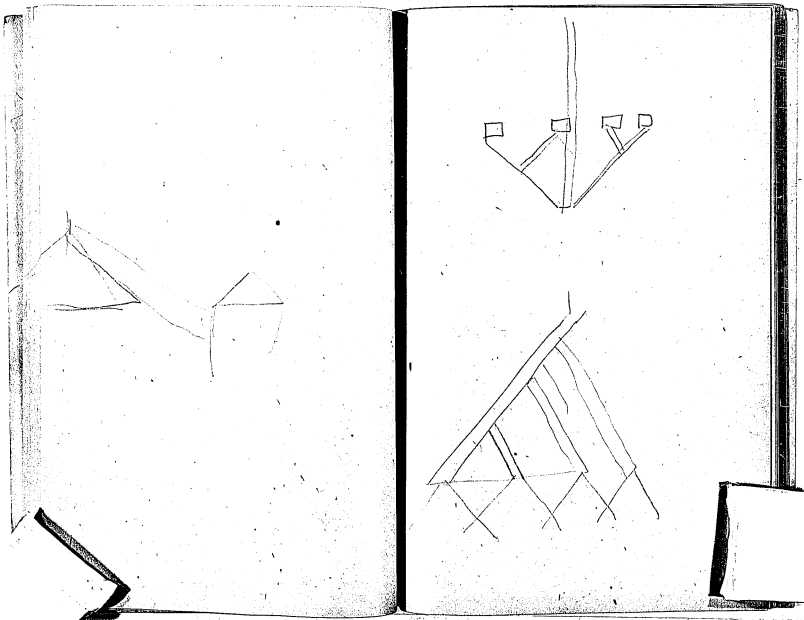
137
175
20
62
75
469

60) 469 (7.8
420
490

378
357
21







2740 / 15336 (6.84
13440
7960
7940
20

3200
684
2516

50% effy of screens
10% effy of Rolls –

32 tons not go rolls - total lifted by elevator & passed by screens –

15336 –

2740
55

896
32
1792
2688
2688 %

32 tons comes hourly.

15336 lb goes thru screens naturally leaving 25.1 tons to go through rolls. Those going through, crushed 10% - gives elevator 1st. 25.60 –
2nd 22.50 – 3rd 20.25 tons –
4th 18.2 5th 16.4 6th 14.4
7th 13.4 8th 12.1 9th 10.9
8th 9.9 9th 9 10th 8.1 11th 7.3
12th 6.6 – 13 5.94 14th 5.35
4.82 4.37 3.91 3.52 3.17

352
35
3.17

391
39
3.52

Bucket from No 1 slope to screens – 40% slufing 1 hour
1280 lb 50% effy 640 lb
leaving 2560 to go through screens –
this is raised by elevator –

25.60
2.50
22.50
2.25
20.25

5.35
.53
4.82

4.82
.48
4.37

.90
.09
.81

320

434
.43
3.91

2025
200
18.25

2560 ghs
640 fine –
250 grits
33⅓ –

32
40
1280

3200
640
2560

18.2
1.8
16.4
16

14.8

2560
3
7680

134
1.3
25.21

148
.14
3.4

890
167

109
10
10.9

9.9
.9
9.0
121
12
10.9

If there was nothing more to be stamped – 10 tons would stand

504
.50
5.35

660
66
594
594
7.3
616

2244
224
8.1
8
7.3

22.4
4.4
8.1 %

443 – lb

32 — ton

30672 lbs in it —
15331 goes

25.1 tons goes to rolls — 50%

12.5

32 1st
25 2nd
12 3
6 4
3 5
1.5 6
.7 7

32 | 80.2 (.3

160
40
20.1

245

2
277
2.50
.77

225
500
112.500

3

80 — 3 hp

32
2
64

25 ft

500

22400
11200
5600
2240

245 8.6 times

32
32 | 277 (8.65 — 317
256 31
210 2.86
192
180

286
25
2.58
25
2.33
23
2.10
21
1.89
18
1.71
17
1.54
15
1.39
13
1.26
12
1.14
11
1.03

2500
22.50
20.25
18.2
16.4
14.8
13.4
12.1
10.9
9.9
9.0
8.1
7.3
6.6
5.9
5.3
4.8
4.3
3.9
3.5
3.1
225.2

2.86
2.58
2.33
2.10
1.89
1.71
1.54
1.39
1.26
1.14
1.00
19.90 tons
225.2
245.10

9.

10 32 | 245 (8.6 times
224
210

1950m | 28,000,000 (14.4
1,950,000
8,216,000
7,800,000
400,000

33mm
1950000

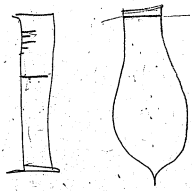
35 kp

1600
5000 (2.4
35000 | 60000
60000
60000
60000
1320
35

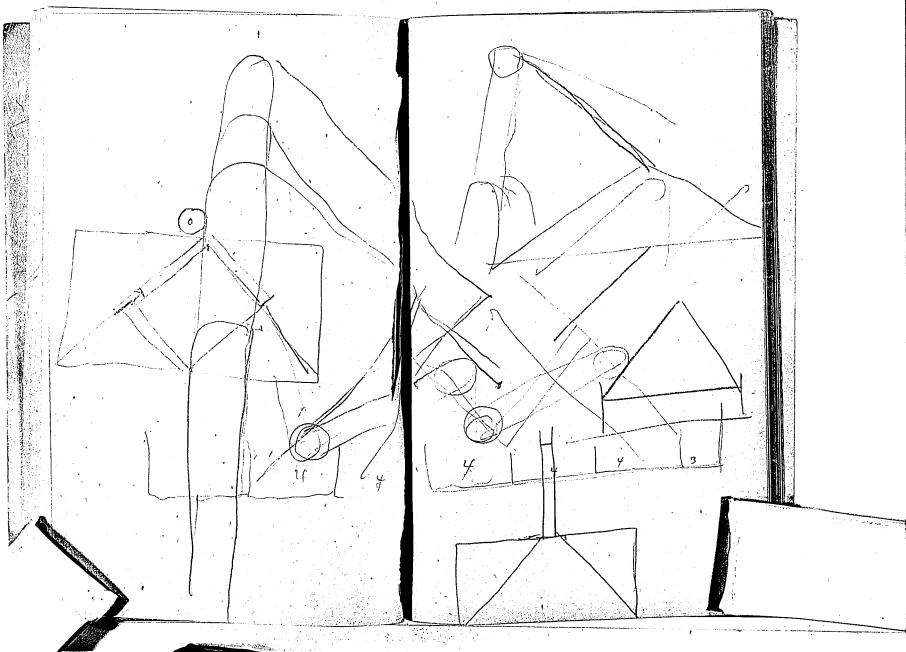
1/2
14-
14-

35-

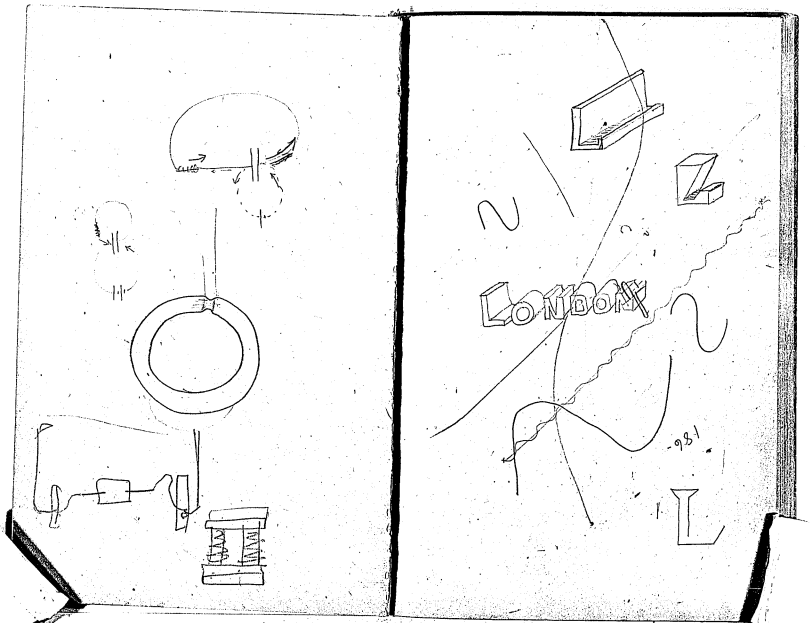
1/4 500
250
1 125
4



82 — 94 + 0.32694
10.32694
62 - 118
621
253 -

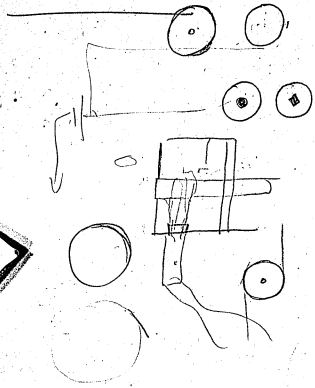


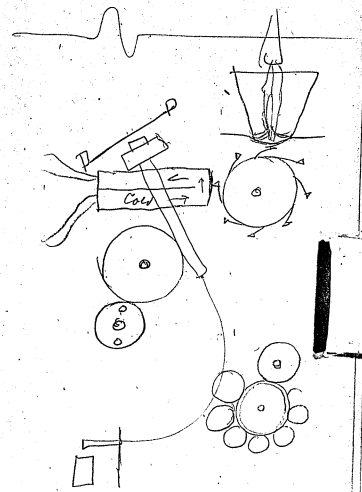
[THIS BOOK WAS USED IN BOTH DIRECTIONS. THE FOLLOWING PAGES WERE FILMED FROM THE BACK END FORWARD.]

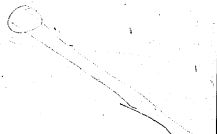


5000 3

3 X 5000 = 15000







30000 / 2240 = 6720 / 6720 = 3

3 tons

4 tons 10 cwt

2240 × 30 = 67200

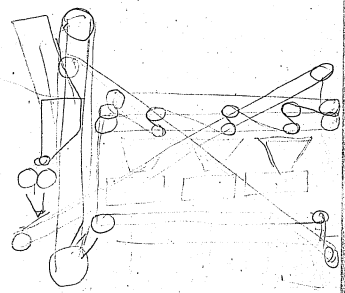
3

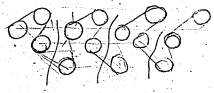
10-

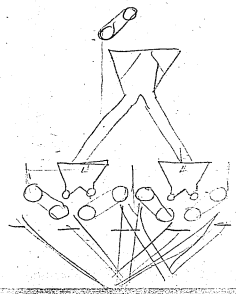
2240 × 4 = 8960

8960 × 16 = 53760

2240 / 53760 = 24







10- 800 300 / 60 20

2400 ton

.13 / .09

100 / 20 / 2000

16 4|17

2|5.86 / 2.9.3

1.682
400
2.82
3.20
9.6 2

4|3.84 / .96

4|3.84 / .96

3|3.77 / 1.25

Drilling. piecework 80 feet day coding only
as much as 60, saves 4 Cents ton Coke
If big rolls made cost drilling per ton say
25% less - hence saves 3.2 Cents ton
(If the 2 broken men are included there
saving be more.)

Blockholing now 2.27 cents reduced
50% — saving 1.12 Cents

Loading 58.6 by repairing
loading should be reduced 50%.
as there will be no sledging + 1 & 3
tons loaded at once, saving 29.3 c

Repairs mine machinery now
3.84 c demurrage Drilling +
bulk handling ought to save 25%
hence .9 of cent

Material now 3.77 Suppose
this is okay now Drills hammers
Shoots - bulk handling less Drilling
by reason of rip rap work + no sledging
should reduce this 33% hence
saving 1.25 Cents

4|384 / 96 / 1.88

3|377 / 125 / 2.52

227
50
1.77

3.10
1.3

16.27
5.42

54.24
5.13
59.37

Coal 3.10 to cost now -- with the climax this should be less say .33% — Saving 1.3 Cents

Explosives — if we rep rap. the explosives should be 33% less makes saving 5.42 Cents its now 16.27 —

Stripping now 9.75 probably lineaflin to about 2 Cents — Saving 7.75 Cents

Total Cost Sept. $114.46 per ton Cmc

Saving

Drilling	7.20
Blockholing	1.12
Loading	29.30
Repairs	00.90
Material	1.25
Coal	1.3
Explosives	5.42
Stripping	7.75
Saving	54.24

114.46
54.24
60.22 possible cost.

3.10
.33%
1.3

1627
5.42
1085

Cable.

Repair labor with new cable & proper solution of the butter difficulty should not exceed 2¢ ton now 7.13 in Sept saving -

5.13 Cent

Total Cost Sept 22.69
Saving 5-13
possible Cost - 17.56

Mill 1 -

All Crushers - Labor Operating in Sept. 5.184. per ton Crus by Roller feeds on both outside crushers as well as inside, there will be 4 men on each shift saved at 1.25 for 8 men to 10.00 Cost of operating say 2 men each shift at 1.50 6 ~~[illegible]~~ man under large Crusher 1.25 both shifts 8.50 is a Crusher foreman necessary if so it is necessary on both shifts. If we average 1800 tons Crush per day, then Cost will be about 2¢ instead of 5.84 saving 3.84 Cents

8.50

5.84
2.00
3.84 00

16/161 10

Say repairs labor same 1 Cent per ton

Concentrate. Say all other items same

by putting small outside Crusher on mill

save 5 hp save 50 Cents per day

or $\frac{1}{8}$ of Cent ton Conc

Crusher Oil now 2.46 ton Conc

if fed sure I can clean + filter this

+ save 7/5 per cent say labor wones

save 1/2 — Saving 1.23 Cents

perhaps grease Cup principle

can be used if too thinned

saves nearly all of the item

1/2 + 1 1/2 Screens. Say one new

screen was put in + much repairing

was done on old ones + the first we

are two use Steel I think a saving

of 4.15 Cents so since it was in

Sept 6.57 — hence Saving 4.15 Cents

7/330
47

15
200
3

Rolls Mill 1

Labor now 1.70. by rods for quick
stop 1 man only necessary hence
saving .85 of cent

Labor repairs outside wooden teeth
which I suppose to putting on + taking
off shells, now we can certainly design
rolls which will only require 4 men
1 hour & supposing we changed a pair
per day Cost would be at most 1/5 d
or 1/8 cent making saving of
including training in shop
= 2.7/ Cents

Material Costs Sept 14.54

now a pair off 300 chrome rolls will
certainly ~~crush~~ 3 pass through 100 ~~000~~
tons + do not crushing in Mill 1 should
never be less than 25% of amount
passed through hence Cost of material
would be about 1.15 per ton crude
or 4.60 per ton Cone, ~~[illegible]~~
to say nothing of fact that 25% of all
we do not go through rolls but
through Bryan rio Screen out,
hence saving on material
will be 9.94 cents

25000.

14.54
4.60
9.9

1.25
.00

2.49
.12
3
2.37

14.54
9.94
4.6

Wooden teeth. With Labor cost
7.24 cents not this can be
Entirely prevented by a breaking
block which Cost nothing practically
hence only natural wear of teeth
+ pinion which should not exceed
1 cent per ton Cone hence
6.24 cents
saving

Driving machinery Mill!
Labor .9 material 5.65
What is this 5. 6.55

Conveying Machinery Labor now
4.39. say this Labor is ok
but material - Material
9.99 - this includes the new 36"
belt, now the old one has done over
100,000 tons so the Cost per ton
Cant exceed 1 cent per Cu Cone
+ saving most of this item is for
belt - we may on more expensive
find saving of 7 cents

Costs in Mill 1 now 85.37

Saving

Labor operating all Crushers	3.84
pulling motor Cor mill	0.12
filling Crusher oil	1.23
1/2 4 1/2 Screens	4.50
Labor rolls	0.85
Labor repairing replacing	2.17
Material	9.99
Wooden teeth	6.24
Converying pipes	7.00
	35.94

Total possible saving

85.37	now
35.94	possible
49.43	Cost

15

$\frac{167}{22}$

447
167
27

1500 20
30000

1500
12

30

300
600

1500
18

50 300
150

50000

Mill 2

50 mesh screens - by new method
The saving in power alone'd more than pay for whole cost screens
now cost 14.41 hence 14.41 Cents saved

Balls - Experiments with heavy feed which new screens will permit gives 20% net of ore passing thru screens
hence assuming Chrome balls + saving removal we have 100 000 passed 20 000 net cost $300. 1.5 Cents ton of 41% ore. or 2.2 Cents per ton
Once a saving of 4 Cents

Lower Repairs are 1.0% saving probably not less than 66% say .6 Cent.

Belt Seperator. If they don't pay
assuming 1/32 poor rubber on belt + 6 times that amount on new belt with twice wear capacity + non breaking crowning
+ assuming old belt did 1500 tons Ore only then new will do 20 times than over 4.47 more
1.6 Cents saving over 2.87 Cents

12.50 for
900
12.00
1.00
7.75
27.25

888 / 27.25 = 1

350) 42.00 (1 10.
350
0

7.7

350) 50.00 (1.4
350
3.00
1.40

24.28
13.00
11.28

If we substitute small bar mang we save 190 horse power & there is practically no repairs but there is some loss of time in direct forge this & make a better Estimate –

The Repairs in Dept. 9.02 but this was for stagging, hence in reg work probably be not over 2 Cents hence 7 Cents saved

Oiling Labor 4.33 think 3 oilers not necessary but as mill will do very much more saving ohmed be 13 Cents

Power is 76.65
allowing couple for labor & only assume 350 ton Cric ohmed be Nat work ohmed 13 Cents Lon Cric made of ohmed 24 28 saving 11 28 Cents

Power

allowing 350 kwh average of Gas
+ 25 than bottled gas. Costs
would be 23.13 instead of
35.81, saving 12.51 Cents

Oil is excessive should be
saving by increased output
only ~~to say~~ nothing else of
33 % - Costs now 5.75
Saving 1.91 Cents

Office - all books changed in one
month instead of over several
Blow for material in Sept 5.65
Reduce say 50% Saving 2.82 Cents

Sawing Mill 2 Cost Sept
53.61 Cents

Sawing	#
Screening	14.41
Rolls	4.00
Repairs rolls	0.60
Belt Sep	2.87
Belt Sep Repairs	7.00
Oiling Labor	1.30
#	30.18

53.61
30.18
23.43 Cost

Power - now 76.65

Labor Sawing	11.28	76.65
Coal	12.57	25.70
Oil	1.91	50.95 Saw
	25.70	
Office	2.82 Saw	

Mining	60.22
Cable	17 56
Mill 1	49.43
Mill 2	23 43
Power	50.95
Offici	2.82
	205.41

left off

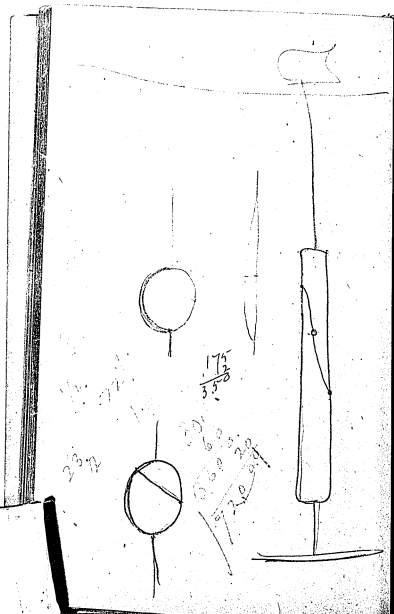
Now put measured out put to diminish general expense & other items & have that (mashed) it will pay the cost of big rolls + new dryer + accidents.

Now	260
Grinding	35
Roylty	45
	340
	24 Cents for all other exp
	364 to total Cost bricked

on car + it must be done

Mill	114.46
Cable	22.69
Stable	5.87
(Mill) Crusher	15 40
½ screen	6 57
Rolls	18 73
Crushing	7.24
	6.56
Drying	14.38
Conveying	1.95
14 m	2 41
	7 28
	4.82

Mill	143.02	59.37
Mill 1	85 37	35.94
Mill 2	53 61	50.18
Electrical office	76 65	25.70
	29.00	
Blacksmith etc	7 87	
	38 99	
Mill primary	429 51	



350) 13350 (38
1050
2850
2800

350) 11300 (32.3
1050
8500
1050
300

Bricking

Material	22.00
1 Labor in mixing Steam +	1.00
2 Mixermen –	

350
22
700
700
770.00

350 tons output

Material 22 c per ton	77.00
Labor steam making material – 8	4.00
2 Mixer men night + day	3.00
8 Loaders Day + night	10.00
1 Car men bricks and 1 night day	2.50
2 foremen day + night	3.50
2 fireman, boys –	2.50
4 unloaders night + day	5.00
4 men in cars for dump	5.00
2 Climax Eng + fireman	5.00
Coal for Dryer	7.00
proportion for power climax	9.00
	133.50

100000 | 17500000 (175
100000
75000000
70000000
5000000

350
1750
4200
3500
7000
7000

9 [illegible]

100000 | 22000000 (22
20000000
2000000

20000
17500

3

Cable –

6 Engrs	12.00
4 Stokers	6.00
2 foremen	3.50
2 Repairers	3.50
4 Signal boys	4.00
2 Car boys –	2.00

Crusher –

4 outside men	6.00
2 under men	3.00
~~2 [illegible]~~	
Rolls 2 men	3.00
2 oilers	3.50
2 bin & screen watch	3.50
4 Dryer men	6.00
4 Barrow	7.50
4 Laborers	5.00
2 Carpenters	5.00
2 Crusher foreman	5.50
2 foreman	6.00
Mill 2 "	
2 Rollman	3.00
	88.00

	88 00
6 orders	9.00
2 screen men	3 00
4 Laborers —	3.00
2 belt men	3 50
2 foremen —	6 00
2 Carpenters —	5 00
2 watchmen	3 50
2 timekeepers —	4 00

Engine -

4 foremen	10.00
2 Laborers	2 50
2 fresh Engs	5.00
2 Boys -	2 50
2 Engs McGill	3 00

Mill 2

2 Engs	5 00
2 Boys.	2 50
1 Repair Eng	2 50
1 Chief	5 00
	65.00
	3 50
50 mech Engs -	168.50

168.50

[illegible]ley	25.00
[illegible]man	8.00
[illegible]smith	2.50
[illegible] boy	1.50
[illegible]keeper	3.00
[illegible]chemist	5.00
[illegible]ray	4.00
[illegible]chinoshop	27.00
[illegible]ocksmith	9.00

[illegible]hinax	5.00
[illegible] loaders	10.00
[illegible] Carmen	2.50
[illegible] fireboys	2.00
2 mixers	3.00
3 formen	4.00
4 unloaders	5.00
4 Gin Cars	5.00
Ship repairs -2-	4.00
Chemicals -	2.50
	296.00
	50.00
2 Carpenters	301.00

301,00.